



The Restriction for Landfill Gas of Conveyance Without a Common Carrier

1. Introduction:

The statute for Massachusetts' renewable energy portfolio standard ("RPS") includes "**landfill gas**" **technology** as a renewable fuel source and authorizes the Department of Energy Resources ("DOER") to "add technologies" provided that "the following **technologies** shall not be considered renewable energy supplies: coal, oil, **natural gas** except when used in fuel cells, and nuclear power." See MGL: Chapter 25A, Section 11F(b).

DOER's regulation as to landfill gas states as an eligible renewable technology: "Landfill methane gas ... provided that such gas is collected and conveyed directly to the Generation Unit **without use of facilities used as common carriers of natural gas**". 225 CMR 14.05(1)(a)(5).

There are two entirely different technologies for generating electricity from landfill gas, both being "**landfill gas**" technologies included by Massachusetts' RPS statute:

(1) the older technology of placing a small, inefficient reciprocal engine attached to a small generator on a landfill and feeding unprocessed landfill gas into the engine/generator ("**On-Site Electric Technology**"); and

(2) the newer technology of processing the landfill gas to natural gas pipeline standards by removing all of the non-methane gasses and delivering by natural gas pipeline the landfill methane to a much larger and more efficient electric generation unit ("**High-Btu Technology**").

Apparently relying on the above RPS statutory language limiting DOER's authority to "**add technologies**" such as "**natural gas**", DOER's regulation on the **already statutorily approved technology of "landfill gas"** added the restriction to landfill gas technology of only landfill gas delivered to the generation unit without use of a common carrier pipeline, as quoted above.

For the reasons stated below, we submit that DOER's restriction on landfill gas technology is neither statutorily required nor consistent with DOER's Mission Statement. Moreover, an unintended consequence of this restriction is to promote the older On-Site Electric Technology and unnecessarily inhibit the newer High-Btu Technology which is much more efficient and environmentally friendly.

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2. Landfill Gas Technologies to Generate Electricity:

Landfill gas is normally 50% methane (1,012 Btu/cf), with the other 50% being mostly carbon dioxide along with some oxygen, nitrogen and other gases. Thus, unprocessed landfill gas contains about 500 Btu/cf, enough to fuel a relatively small reciprocating engine to drive a generator as used by On-Site Electric Technology. The problem is that these generation units used in On-Site Electricity Technology have relatively inefficient heat rates, ranging from 10,000 Btu/kWh to 15,000 Btu/kWh. Moreover, the On-Site Electricity Technology emits NOX and SOX with minimal pollution control equipment. However, the vast bulk of landfill gas-to-energy projects use On-Site Electricity Technology even though the technology is rudimentary and outdated.

In contrast, the more recent High-Btu Technology processes the landfill gas to meet natural gas pipeline specifications (usually > 970 Btu/cf; < 0.2% O₂; < 4% CO₂ & N₂) by removing the non-methane gases, resulting in nearly pure landfill methane. By meeting pipeline specifications, the landfill methane may be delivered by natural gas pipelines to much more efficient generation units such as a combined cycle gas turbine generation unit, having heat rates as low as 6,800 Btu/kWh (**32% more efficient than the best units used by On-Site Electric Technology**). Moreover, these utility-sized generation units have much more pollution control equipment than the smaller units used by On-Site Electricity Technology.

Thus, of the two landfill gas technologies used to generate electricity, High-Btu Technology is much more efficient in using landfill gas to generate electricity and is much more environmentally friendly. Yet, the DOER restriction on landfill gas technology promotes the inefficient, polluting On-Site Electric Technology and excludes the superior landfill gas High-Btu Technology.

This exclusion of the superior High-Btu Technology seems contrary to DOER's Mission Statement of: "Creating and leading implementation of energy strategies to assure reliable supplies and improve relative cost".

3. High-Btu Technology Is Not Within the "Natural Gas" Statutory Restriction:

As discussed, Massachusetts' RPS statute expressly includes "landfill gas" technologies and authorizes DOER to "add technologies" but not to add "natural gas" technologies "except when used in fuel cells". The question is whether landfill methane produced by High-Btu Technology stops being from "landfill gas" technology and becomes only "natural gas" technology when the landfill methane is delivered by a

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common carrier pipeline. Whether in a common carrier pipeline or not, landfill methane produced by High-Btu Technology is still landfill methane gas.

4. Reasonable Restrictions for Landfill Gas Delivered by Common Carrier:

Another question might be: if landfill methane is delivered by natural gas pipelines which also transport non-renewable natural gas, how do we know that the landfill methane is used by the generation unit claiming its use? This is a legitimate question for purposes of a RPS program. But this question goes to a different issue than whether delivery by natural gas pipelines converts landfill methane produced from High-Btu Technology into exclusively “natural gas” technology.

The Connecticut Department of Public Utility Control (“DPUC”) addressed the questions raised by delivery of landfill methane to a generation unit using natural gas common carrier pipelines in its November 24, 2004 Decision involving Magellan EnviroGas Partners, LLC at Docket No. 03-12-10, as affirmed and expanded by the October 31, 2007 Decision at Docket No. 03-12-10RE01 (the “Magellan Decisions”):

“In order for the Department [of Public Utility Control] **to verify the quantity and renewable nature of the fuel delivered to Connecticut generators from Magellan landfills [in Pennsylvania]**, Magellan and/or the generators would need to periodically **provide sufficient information to the Department and the New England Power Pool (NEPOOL) Generation Information System (GIS)** so that they can determine: a) [1] the amount of **non-renewable fuel**, if any, **mixed** with the LMG [landfill methane gas] or [2] **consumed in the purification process** (any amounts of such non-renewable fuel must be netted out of the Class I renewable electricity otherwise deemed generated from fuel provided by Magellan); and b) [3] the **amount of Magellan delivered fuel, net** of any applicable **fuel consumed or loss during transport**, and separate from any natural gas also delivered to the generators

Upon meeting the aforesaid conditions, the Department further requires that Magellan and/or the generators periodically provide **sufficient information to the Department and the NEPOOL GIS to verify** that the **LMG** that is gathered by Magellan, processed, injected into a common carrier pipeline and delivered to generators in Connecticut **is [4] injected into and withdrawn from the pipeline in a manner and timing consistent with the transport of fuel** between the injection and withdrawal points, [5] that Magellan or the generators have a **contracted transportation path** on the pipeline between the two points, and [6] that the fuel and its renewable attributes have been **uniquely sold to and used by the generators.**” (Emphasis & bracketed numbers added).

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These restrictions imposed by the Connecticut DPUC on landfill methane (particularly, “a contracted transportation path” and the landfill methane being “uniquely sold and used by the generators”) are reasonable safeguards to insure that landfill methane produced by High-Btu Technology retains its renewable energy character even though delivered by common carrier pipelines. Such restrictions are a far better solution than that of effectively banning from RPS qualification the superior High-Btu Technology, as results from DOER’s current regulations.

5. Public Policy Considerations:

Because Massachusetts’ RPS statute expressly makes eligible “landfill gas” technology for producing electricity, it is submitted that public policy considerations should be DOER’s guide for any restrictions on generation from landfill methane produced by High-Btu Technology. Clearly, some restrictions are appropriate where landfill methane is delivered by common carrier natural gas pipelines.

The above-quoted Connecticut DPUC restrictions in the Magellan Decisions reasonably resolve all of the issues raised by landfill methane being delivered by natural gas pipelines. By requiring a direct contractual pipeline path from the High-Btu Technology plant to the subject generation unit as well as requiring that the landfill methane be uniquely sold to, and used by, the generation unit, issues of possible double counting for landfill methane delivered into a natural gas pipeline are properly resolved.

Landfills are sited for reasons separate from renewable energy considerations. Prohibiting for RPS qualification delivery of landfill gas by common carrier will not promote more landfills in Massachusetts, even assuming that were a desirable goal.

But prohibiting for RPS qualification delivery of landfill gas by common carrier will certainly promote the use of the landfill gas technology which is the least efficient and most polluting while also discouraging High-Btu Technology which is the best use of landfill gas.

It is respectfully submitted that the DOER should follow the public policy embodied in the Megellan Decisions and encourage the superior High-Btu Technology with reasonable restrictions rather than total exclusion.

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